CLAIMS

1. Compliant substrate (5, 20, 30) comprising a carrier (1, 14, 21, 31) and at least one thin layer (4, 13, 23, 34) formed on the surface of said carrier and intended to receive, in integral manner, a stress-giving structure, the carrier and the thin layer being joined one to another by joining means (3; 11, 15, 16; 24, 25) such that the stresses brought by said structure are absorbed in whole or in part by the thin layer and/or the joining means, characterized in that said joining means comprise at least one joining zone chosen from among the following joining zones: a layer of microcavities and/or a bonding interface whose bonding energy is controlled to permit the absorption of said stresses.

2. Process for fabricating a compliant substrate according to claim 1, characterized in that the layer of microcavities is created through implantation by bombardment of one or more gas species.

3. Process according to claim 2, characterized in that the gas species are chosen from among rare gases, hydrogen and fluorine.

4. Process according to ~~either of claims 2 or 3,~~ claim 2 characterized in that doping agents are associated with the one or more gas species.

5. Process according to claim 2, characterized in that diffusion is made of the one or more implanted gas species.

6. Process according to claim 2, characterized in that implantation is followed by heat treatment.

7. Process according to ~~any of claims 2 to 6~~ Claim 2, characterized in that said implantation is made via the substrate surface, the region lying between the substrate surface and the layer of microcavities providing said thin layer.

8. Process according to claim 7, characterized in that the region lying between the substrate surface and the layer of microcavities is thinned to form said thin layer.

9. Process according to claim 7, characterized in that implantation by bombardment is made via a sacrificial layer (2) carried by said substrate surface, said sacrificial layer then being removed.

10. Process according to ~~any of claims 2 to 6~~ Claim 2, characterized in that said implantation is made via the substrate surface, this surface carrying a first thin layer, the region lying between the substrate and the layer of microcavities providing a second thin layer.

11. Process according to claim 10, characterized in that the layer of microcavities is made in the vicinity of the interface between the first thin layer and the substrate.

12. Process according to ~~either of claims 10 or 11~~ Claim 10, characterized in that implantation by bombardment

is made via a sacrificial layer carried by the first thin layer, said sacrificial layer then being removed.

13. Compliant substrate according to claim 1, characterized in that bonding energy is controlled by surface preparation and/or heat treatment and/or creation of defects at this interface.

14. Compliant substrate according to claim 13, characterized in that surface preparation is a control of roughness and/or hydrophilia.

15. Compliant substrate according to ~~either of~~ claims 13 or 14, characterized in that said joining zone also comprises at least one intermediate layer (22; 32, 33) between the thin layer (23; 34) and the carrier (21; 31).

16. Compliant substrate according to claim 15, characterized in that the intermediate layer (22; 32, 33) is a metal layer or metal alloy layer.

17. Compliant substrate according to claim 15, characterized in that at least one intermediate layer is formed such that it is made up of non-homogeneities able to relax stresses.

18. Compliant substrate according to ~~any of~~ claims 1 to 17, characterized in that the joining means comprise a layer of microcavities and a bonding interface arranged either above or below the layer of microcavities.

19. Compliant substrate (5, 20, 30) according to ~~any of the preceding claims,~~ characterized in that said thin layer (4, 13, 23, 34) is in a first crystalline material and is intended to be used as hetero-epitaxial growth seed for a second crystalline material forming said structure.

20. Compliant substrate according to claim 19, characterized in that said thin layer is a pre-stressed layer through the insertion of a foreign element in said first crystalline material in order to promote the compliance of said substrate.

21. Compliant substrate according to claim 20, characterized in that the foreign element is inserted through implantation by bombardment and/or inserted by diffusion.

22. Compliant substrate according to ~~either of claims 20 or 21,~~ characterized in that said foreign element is a doping agent of the thin layer.

23. Compliant substrate (5, 20, 30) according to ~~any of claims 19 to 22,~~ characterised in that said first crystalline material is a semiconductor.

24. Application of the compliant substrate (5, 20, 30) according to ~~any of claims 19 to 23~~, to the hetero-epitaxial growth of a crystalline material chosen from among GaN, SiGe, AlN, InN, and SiC.